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REPORT 159

Satellite-Tracked Buoy Data Report IX South-West Pacific and Indian Oceans and Great Australian Bight January to June 1982

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SATELLITE-TRACKED BUOY DATA REPORT IX. SOUTH-WEST PACIFIC AND INDIAN OCEANS AND GREAT AUSTRALIAN BIGHT JANUARY TO JUNE 1982

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Abstract

Track, speed and sea surface temperature data are presented from buoys tracked the period January to June 1982. Five buoys were released in the Tasman Sea, five in the Indian Ocean off Western Australia and two in the Great Australian Bight. They were tracked by the French System ARGOS on board the TIROS-N satellite.

Introduction

This is a further report in the series 'Satellite-Tracked Buoy Data Report' presenting data collected by free drifting buoys whose location and data telemetry is carried out by the French System ARGOS (Taillade 1978) on board the TIROS-N satellite. This report, which continues immediately on from Report VIII (Wells 1983), deals with five buoys continuing in service in the Tasman Sea, five buoys in the Indian Ocean associated with a study of the North West Shelf region and the southward flowing Leeuwin Current (Cresswell and Golding 1980) and two buoys in the Great Australian Bight, within the eastward flowing extension of the Leeuwin Current.

The Buoys

Two varities of the torpedo buoy (Cresswell *et al.* 1978) were used. One carried a transmitter built by Handar (U.S.A.) while the other carried a more compact CEIS-Espace (France) transmitter. In the latter case the hulls were reduced in size and the antenna and ground plane were mounted inside the hull. Each variety is indicated by either an H (Handar) or a C (CEIS-Espace) in parenthesis following the buoy identification number.

The buoys contributing data to this report are:

01831(H) was deployed off HMAS 'Kimbla' in the Tasman Sea early in 1981 with the parachute drogue tethered at 200m depth. It ran aground at Coniston Beach, near Wollongong on day 073-1982.

01835(H) was first released in the Tasman Sea during December 1980 with its drogue tethered at 200m. Transmissions from this buoy were intermittent early in the period presented here. It appeared that the charging efficiency was low during this period but improved during the day 090-180 period.

01836(H) was deployed with a 200-m drogue tether in the Tasman Sea and ran aground at Gerroa, north of

Jervis Bay, in New South Wales on day 016-1982. It was redeployed off North West Cape, Western Australia from F.R.V. 'Soela' on day 82-1982 with its drogue tethered by a 20-m stainless steel wire. It followed the Leeuwin Current until running aground on day 170-1982 near Mandurah, south of Perth.

01837(H) was deployed in the Tasman Sea and ran aground at Fullers Beach, south of Narooma, New South Wales on day 057-1982. It was redeployed off the North West Shelf, Western Australia with a 20-m stainless steel drogue line, on day 089-1982. Transmissions from the buoy ceased on day 122-1982.

01838(H) has a transmitter from a British buoy that ran aground in Western Tasmania now used in one of the torpedo buoy hulls and was first released into the Tasman Sea from R.V. 'Sprightly' on day 188-1981 with its drogue tethered at 200m. Its temperature data are not presented in this report as the transmission format is not compatible with our computer programs. The buoy spent several weeks (days 40 to 90) in a cyclonic eddy.

01839(C) was the first of the CEIS Espace transmitters to be used. It was released on day 127-1982 from R.V. 'Sprightly' off the North West Shelf, Western Australia with a 20-m stainless steel drogue line.

01840(C) was released from R.V. 'Sprightly' on day 130-1982 off North West Cape, Western Australia with a 20-m tether to its drogue. It was carried southward at speeds sometimes exceeding 1 m s^{-1} apparently into the Leeuwin Current.

01841(C) was released from R.V. 'Sprightly' on day 172-1982 off Albany, Western Australia. It had a 20-m tether to its drogue and was influenced by eddies at the edge of the Leeuwin Current.

01842(C) was released from R.V. 'Sprightly' on day 169-1982 west of Fremantle, Western Australia. After 5 days the drogue was apparently lost (the buoy moved with the prevailing wind rather than current) and the buoy ran aground near Busselton. The loss of the drogue may have been caused by a shackle not being secure after a tangle during launching.

01843(C) was released from R.V. 'Sprightly' on day 176-1982 in the Great Australian Bight and was carried eastward. The buoy had a 20-m tether to its drogue.

Data Handling

The data used to produce this report arrive monthly from Service ARGOS on magnetic tapes which are read on the CSIRONET CYBER computer and then transmitted to the CSIRO Marine Laboratories inhouse PDP-11/34 computer for final processing and plotting.

Data Presentation

The data presented in two ninety-day sets (days 000-090 and 090-180, 1982) as computer plotted buoy tracks on a 9° latitude x 15° longitude mercator projection with time series both of all temperature data and buoy speed calculated between the first locations for each day.

In one case, for buoy 01836, two 9° x 15° buoy tracks and temperature records have been presented for the period days 000 to 090. During this period the buoy spent time both off the Eastern and Western coasts of the continent.

Buoy Tracks

As can be seen from Figure 1, a composite plot of all buoy tracks for days 000 to 090-1982, the main features are the remnants of eddy 'Mario' (Cresswell 1982*a*,*b*) and a cyclonic feature east of Cape Byron. From Figure 2, the composite plot for days 090 to 180 the main feature is the Leeuwin Current running along the eastern boundary of the Indian Ocean.

Acknowledgements

The authors thank the following people for their valuable assistance in the running of the satellite-tracked buoy program: A. Metso for the assembly and installation of the electronics packages, W. Prothero and D. Page for preparing the drogue rigging, D. Crooks for computing assistance and the captains and crews of R.V. 'Sprightly' and F.R.V 'Soela' for their assistance in launching the buoys.

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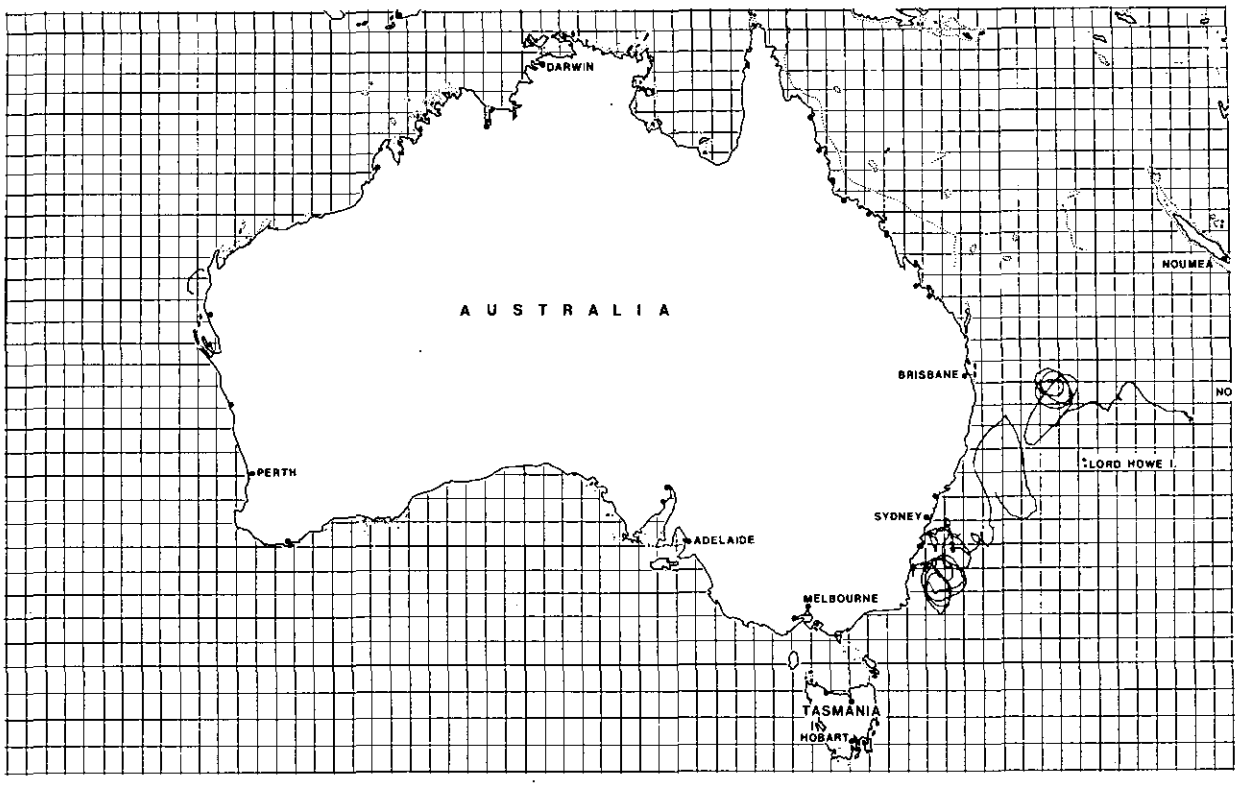


Figure 1: Composite buoy tracks, days 000-090

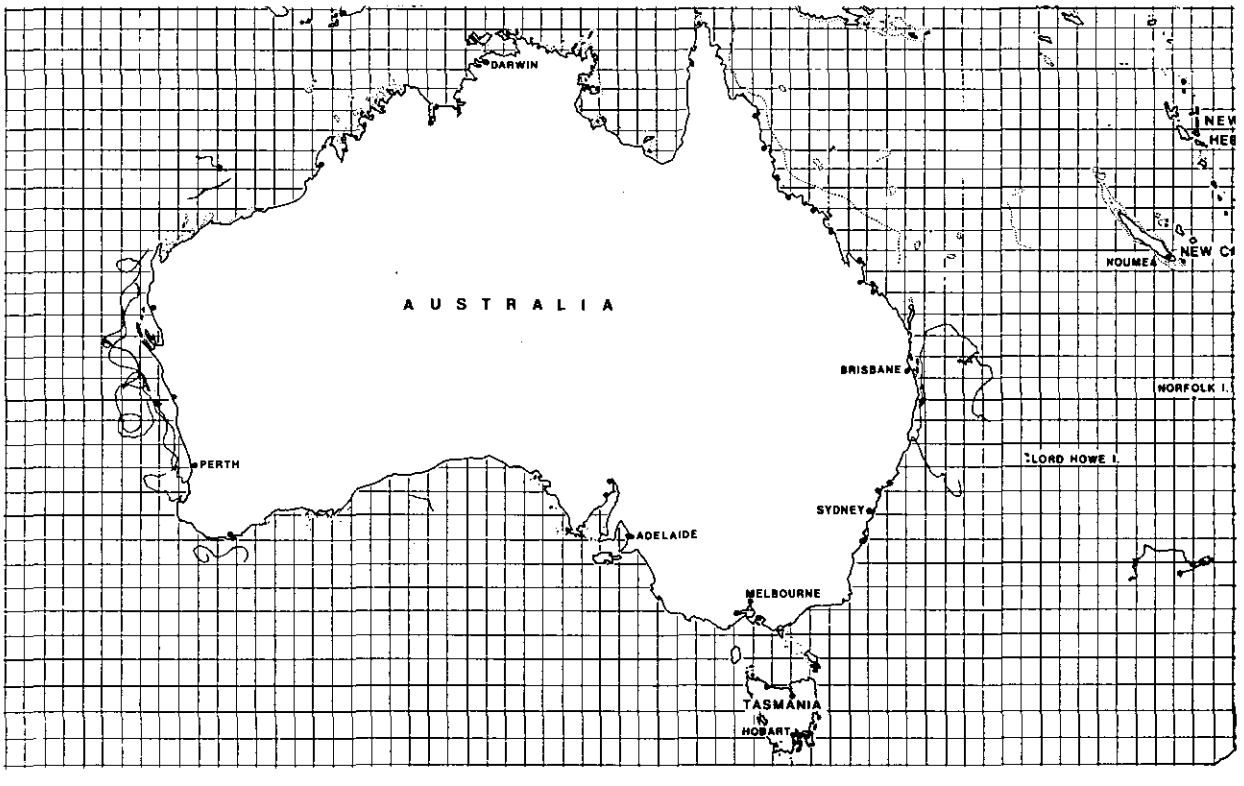
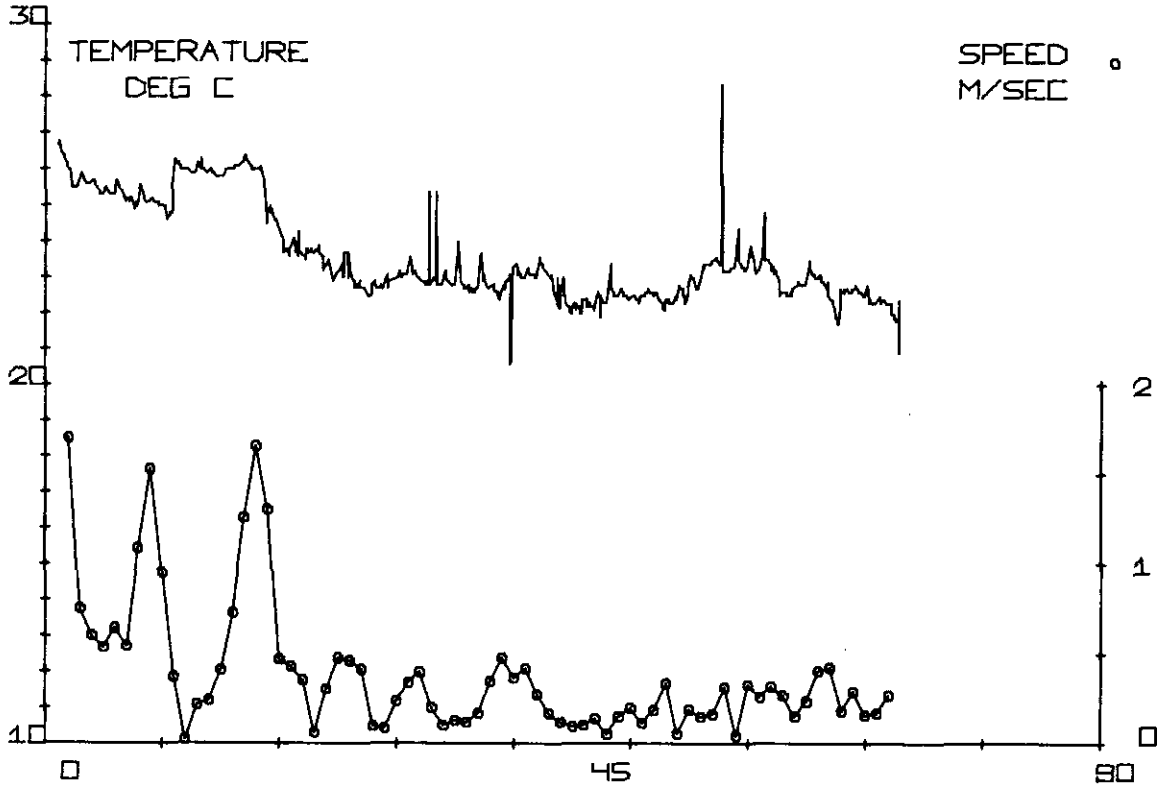
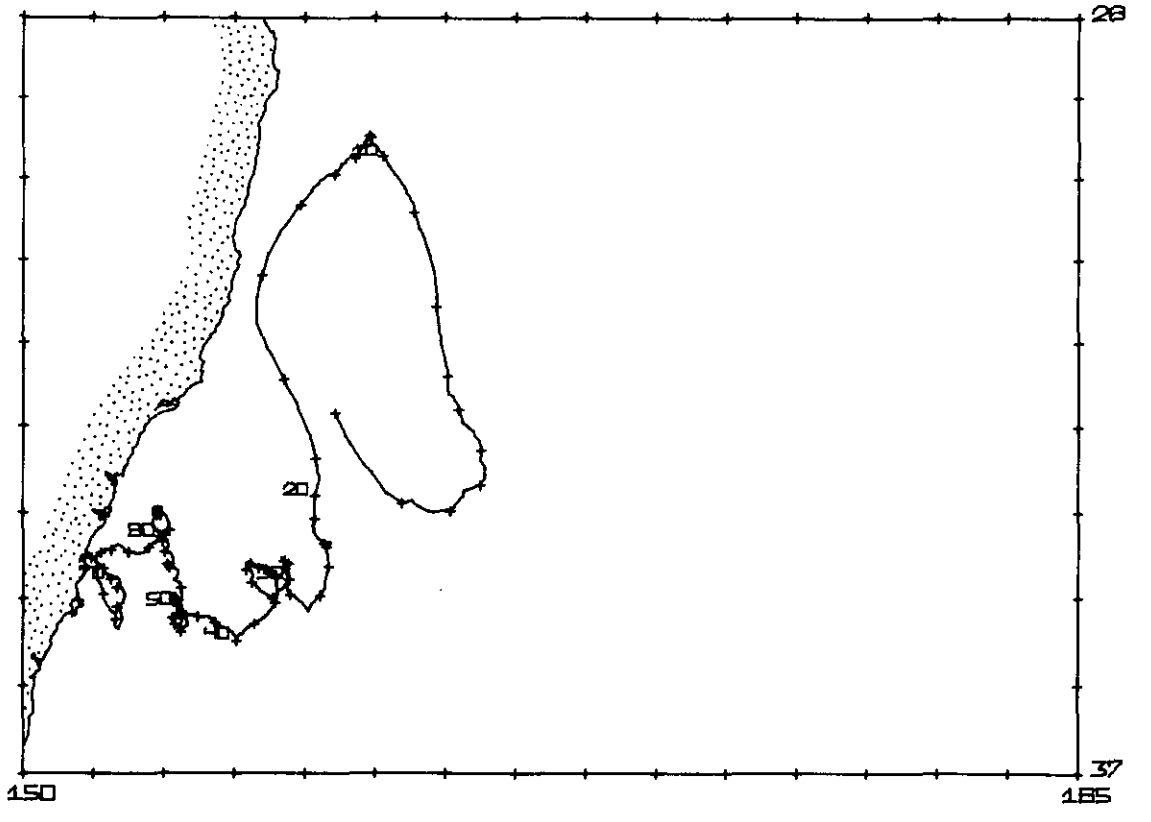
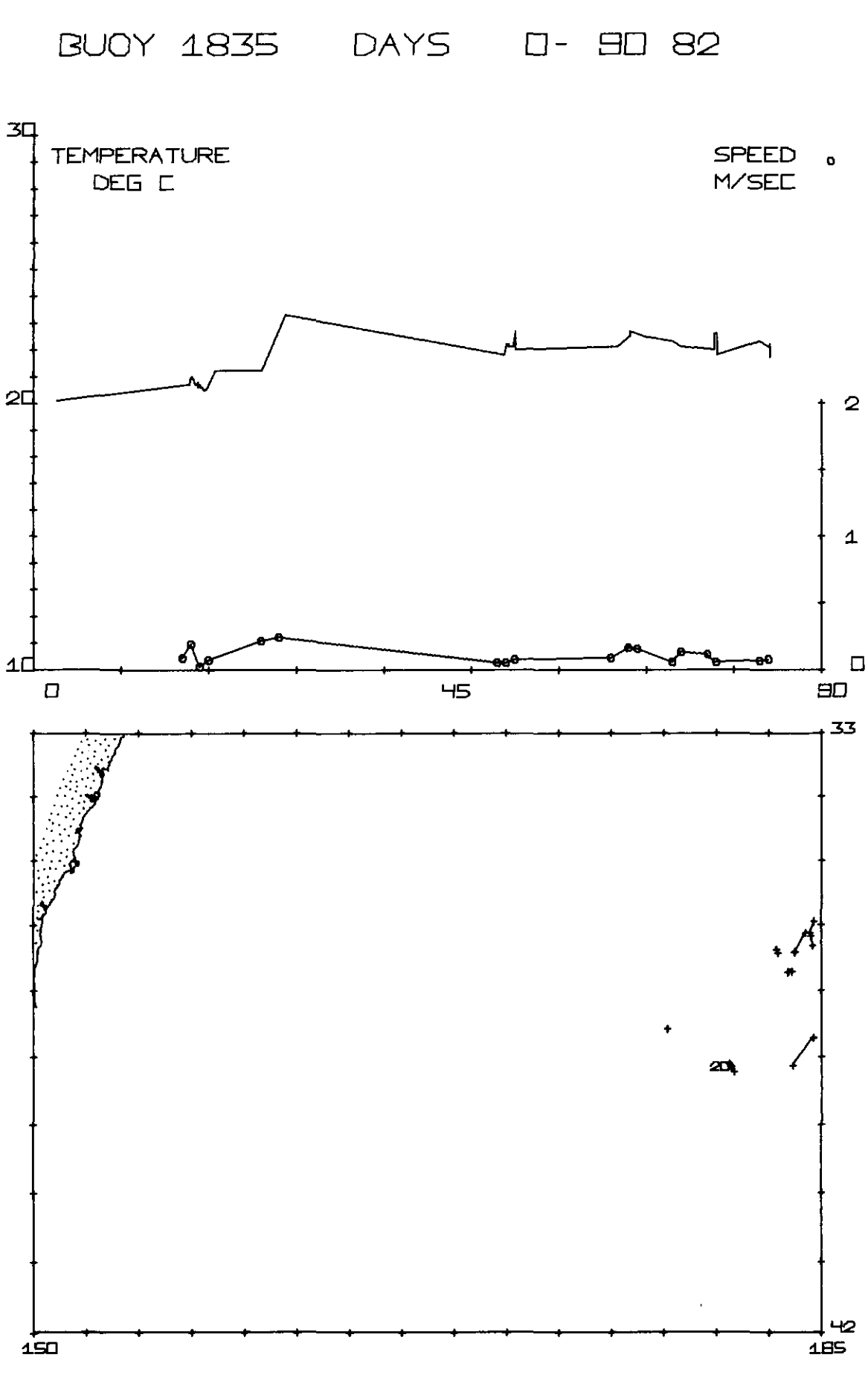


Figure 2: Composite buoy tracks, days 090-180

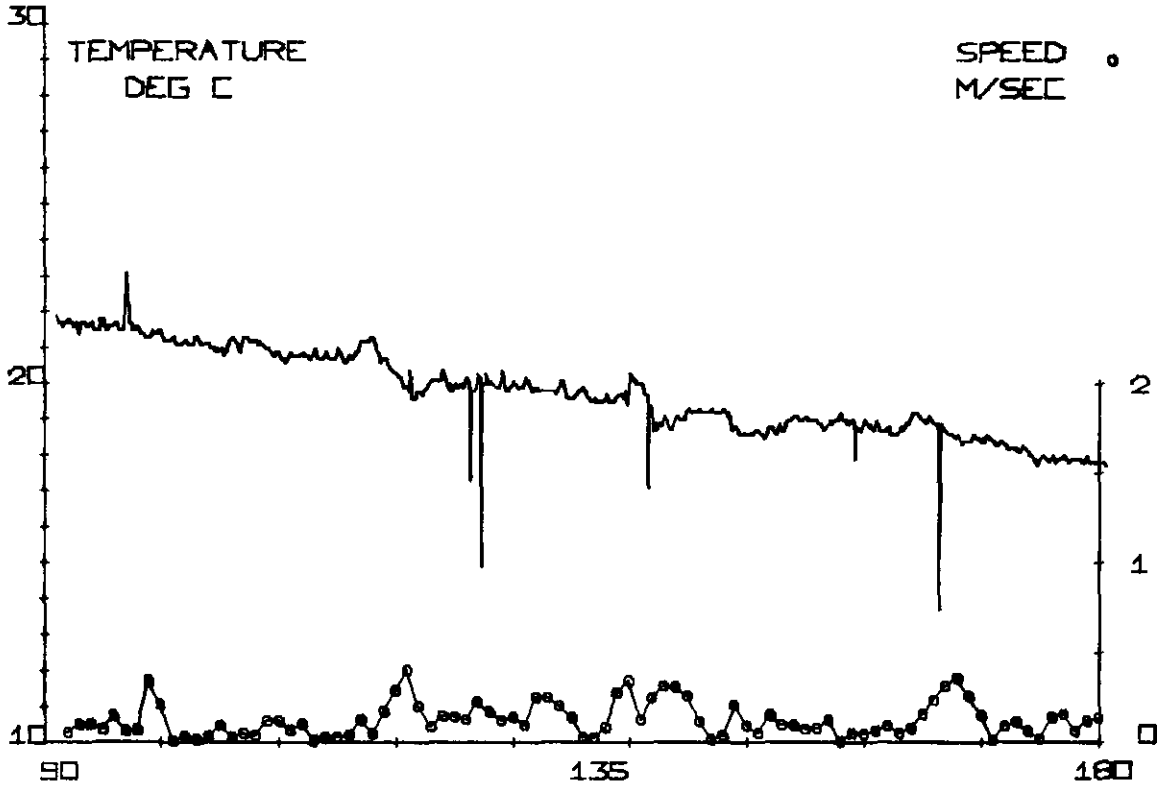
BUOY 1831 DAYS 0- 90 82

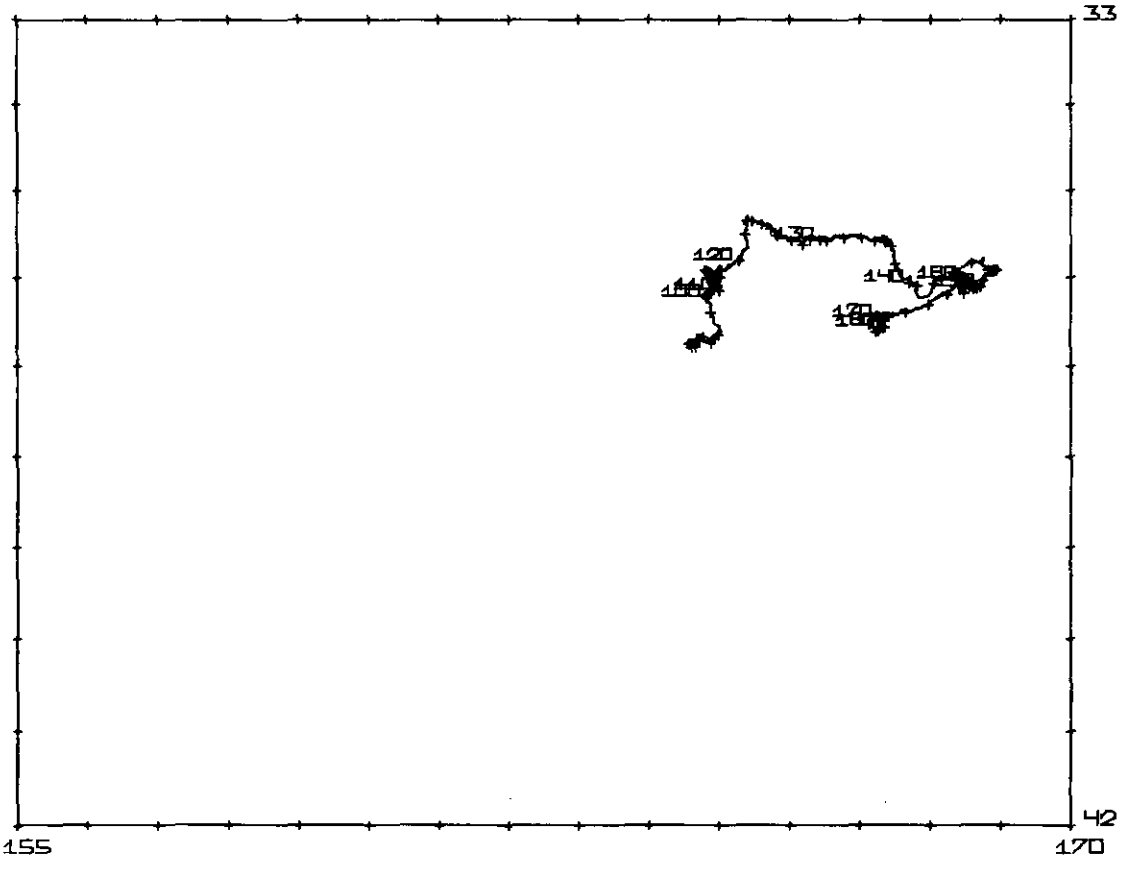





BUOY 1835 DAYS 0- 90 82
30
TEMPERATURE
DEG C
SPEED
M/SEC
20
10
2
1
0
0
45
90
33
42
150
185

BUOY 1835 DAYS 90-180 82





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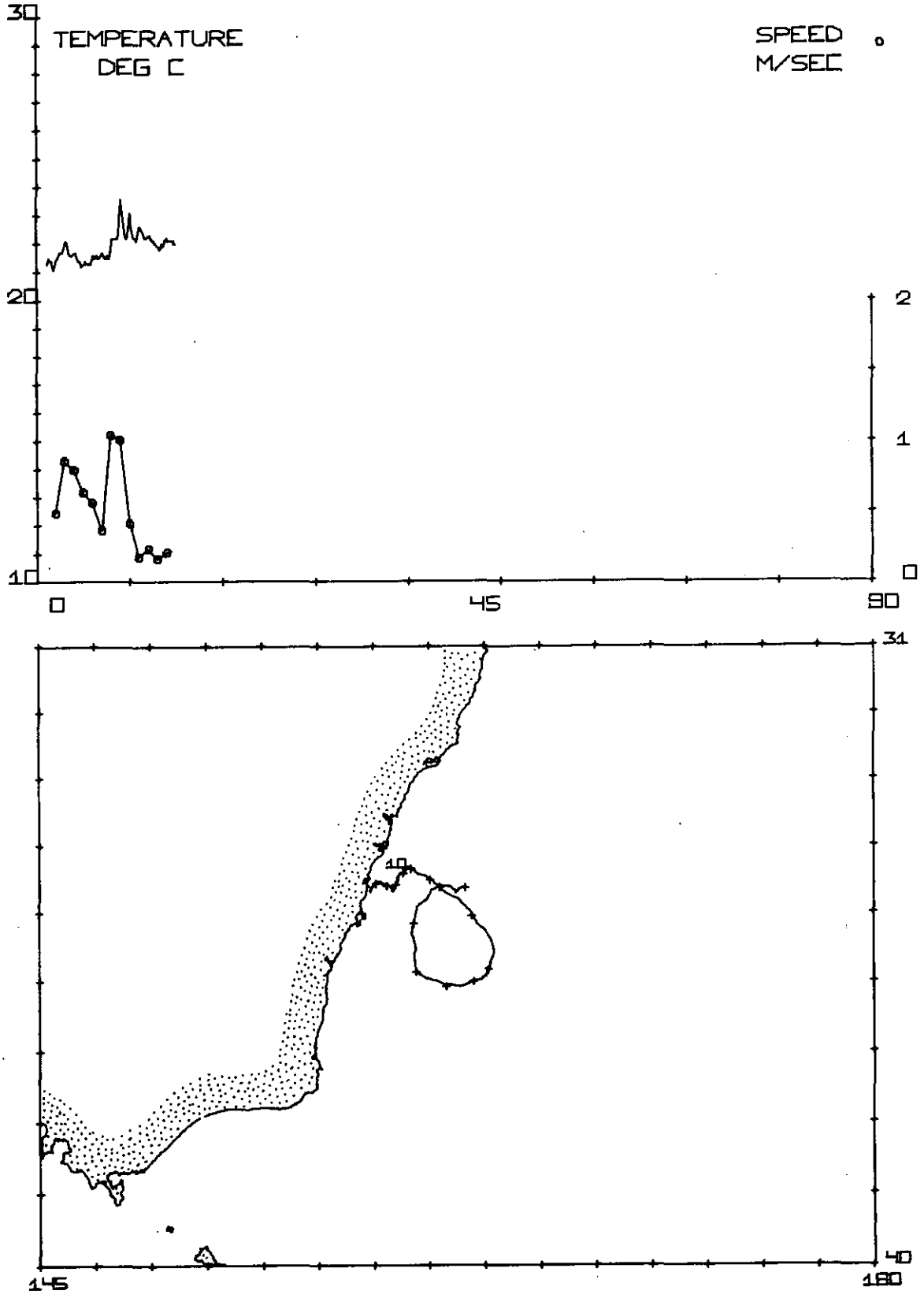

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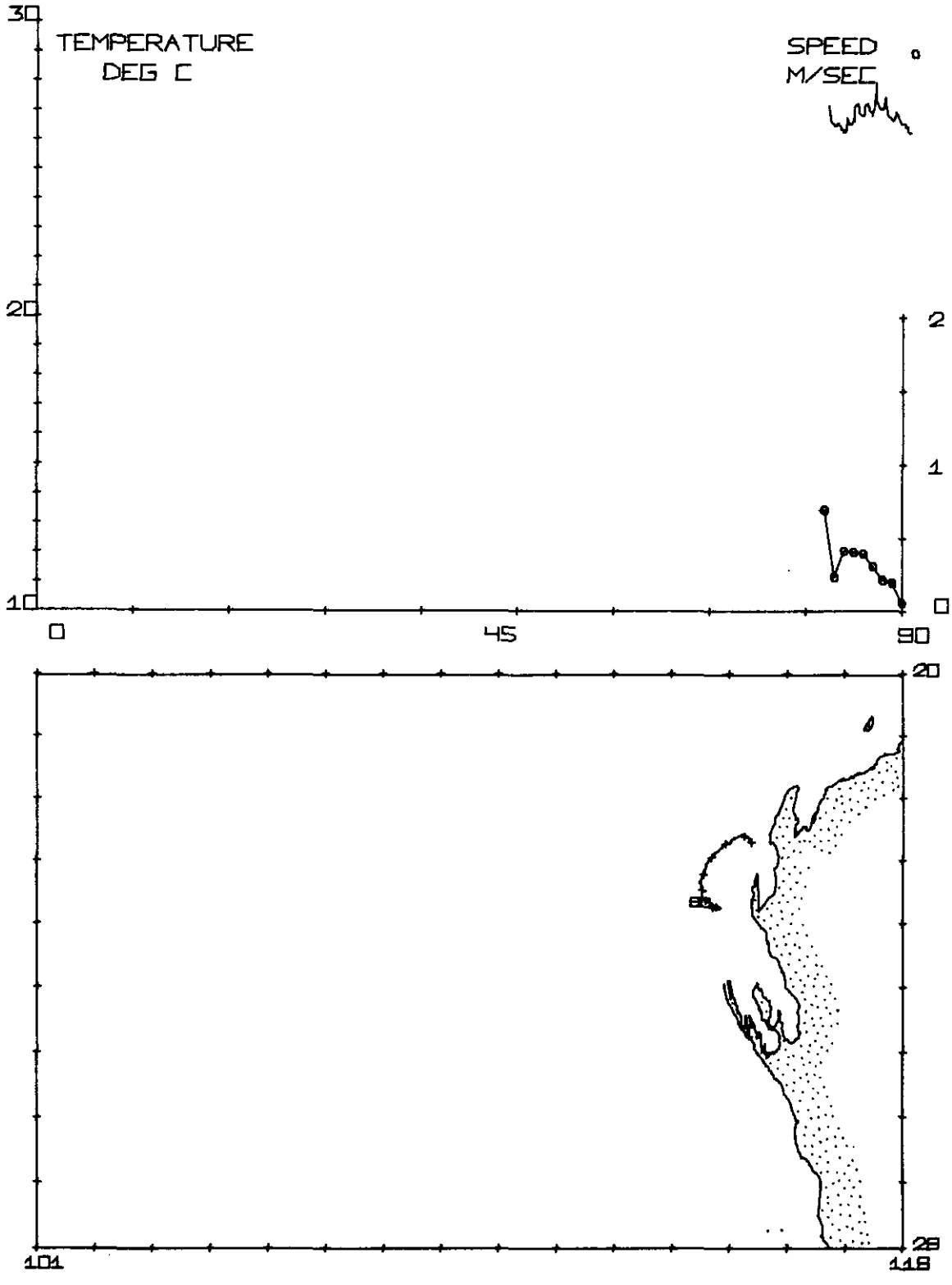

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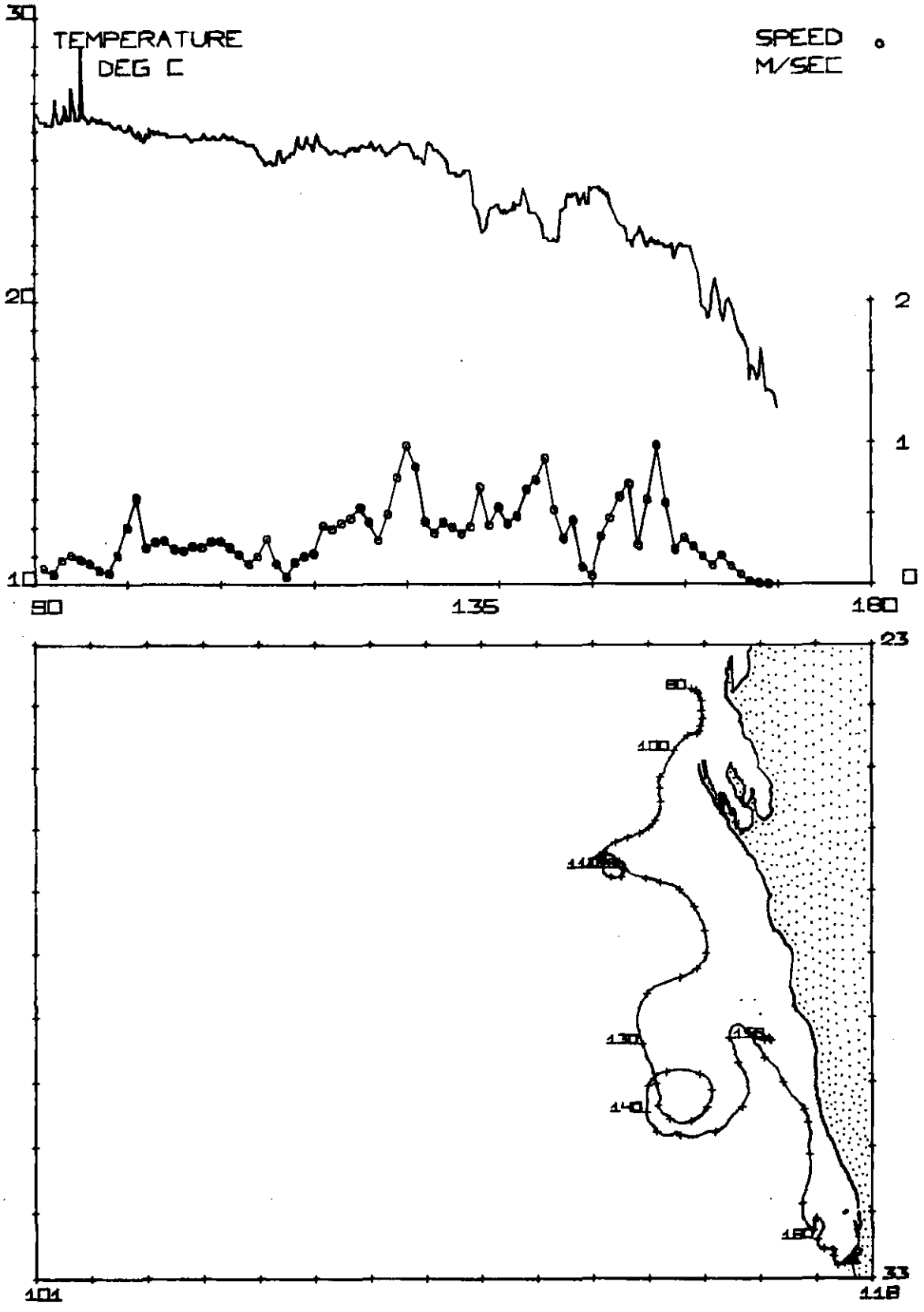

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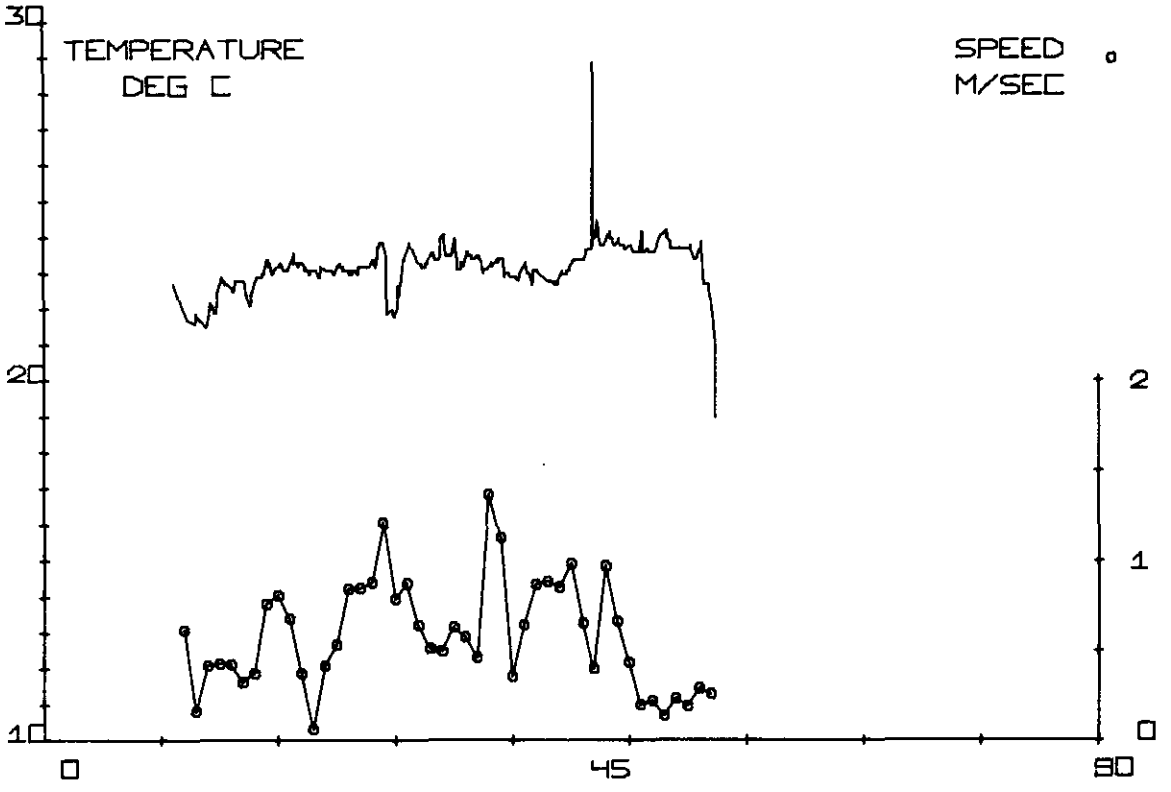

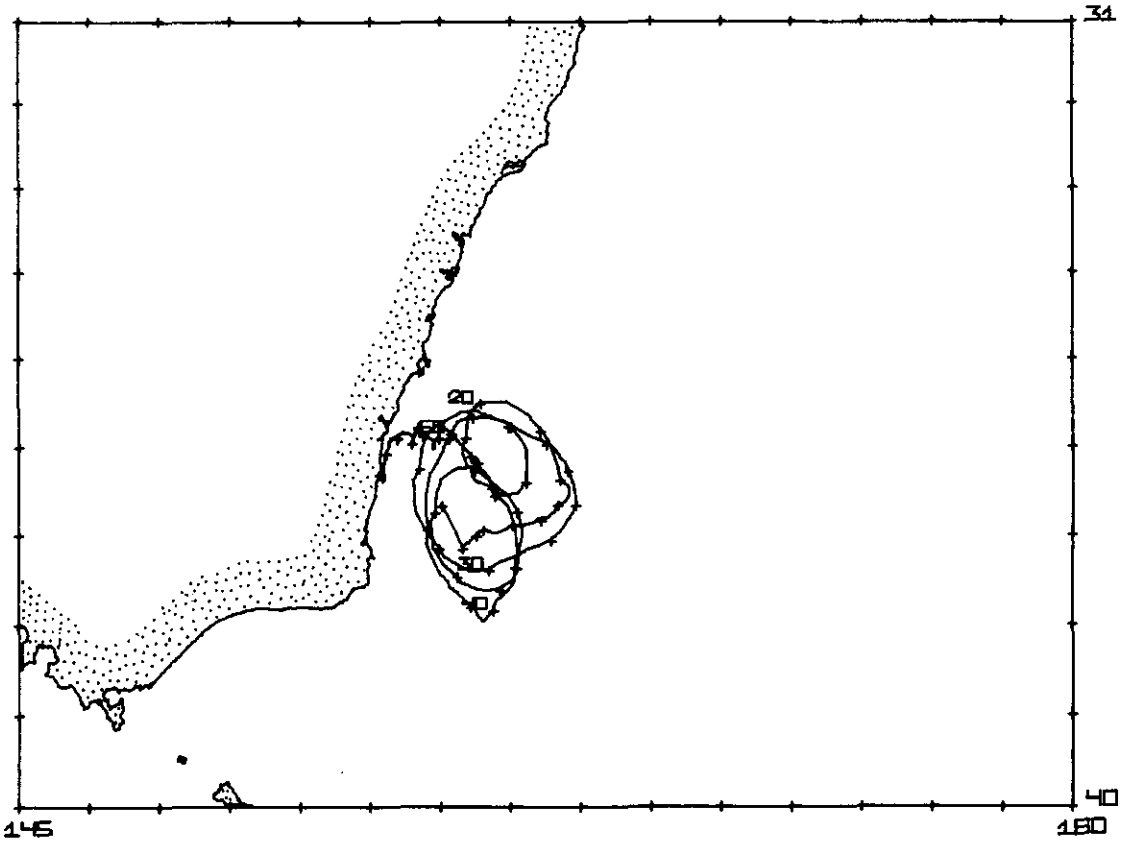

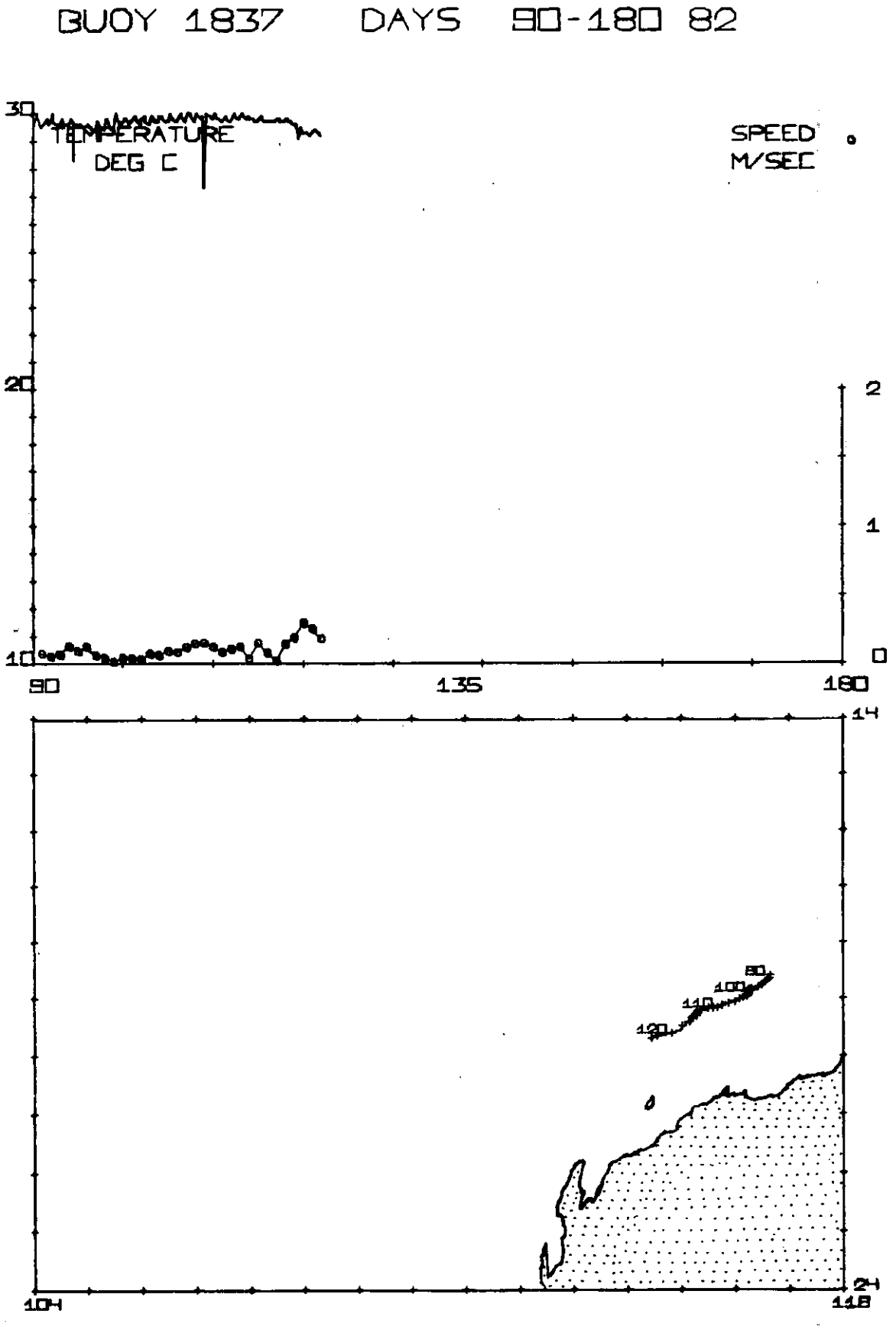
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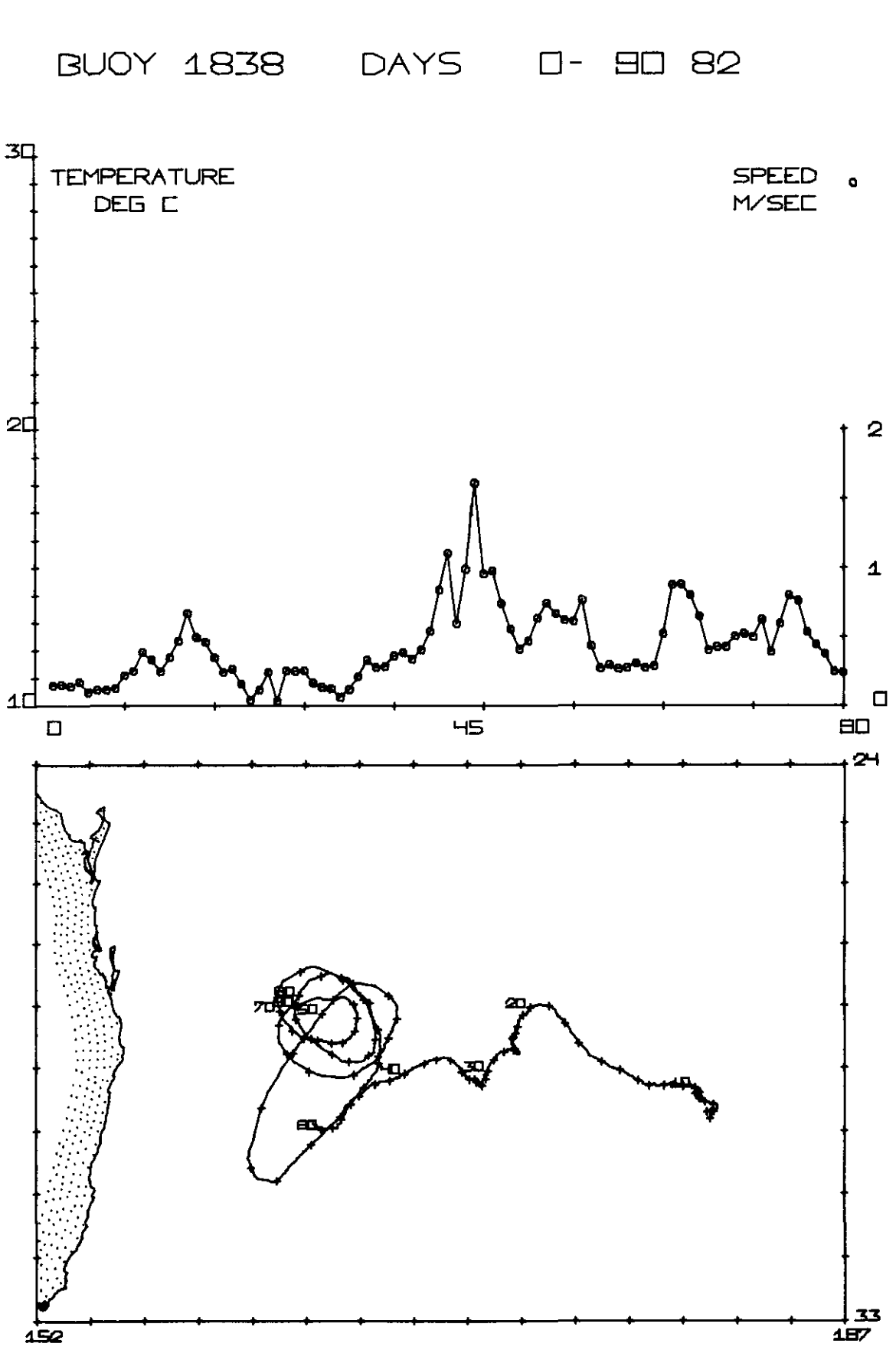
30
TEMPERATURE
DEG C
SPEED
M/SEC
20
10
2
1
0
90
135
180
14
80
100
110
120
0
24
104
118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30
TEMPERATURE
DEG C
SPEED
M/SEC
20
10
2
1
0
0
45
80
24
33
152
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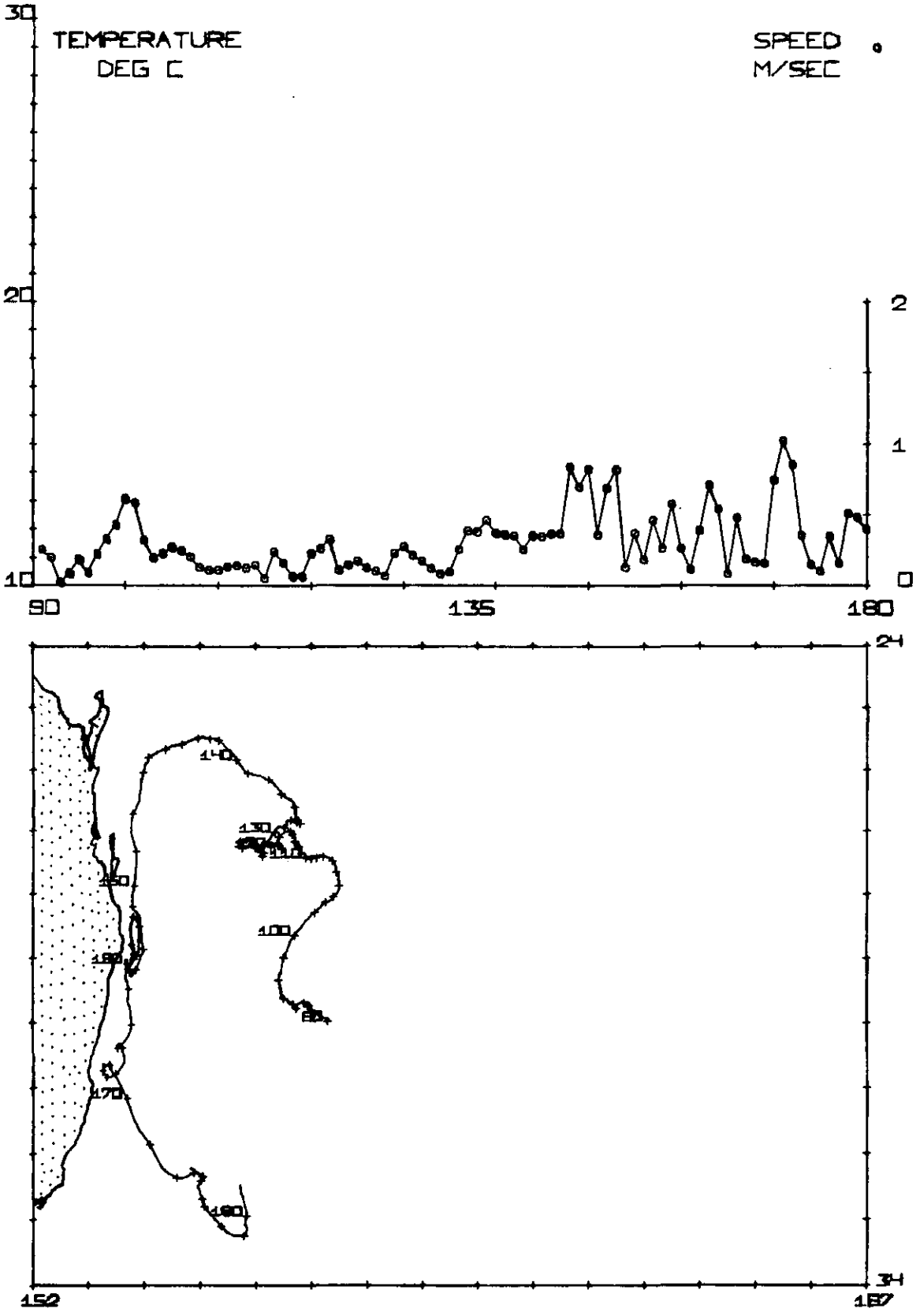
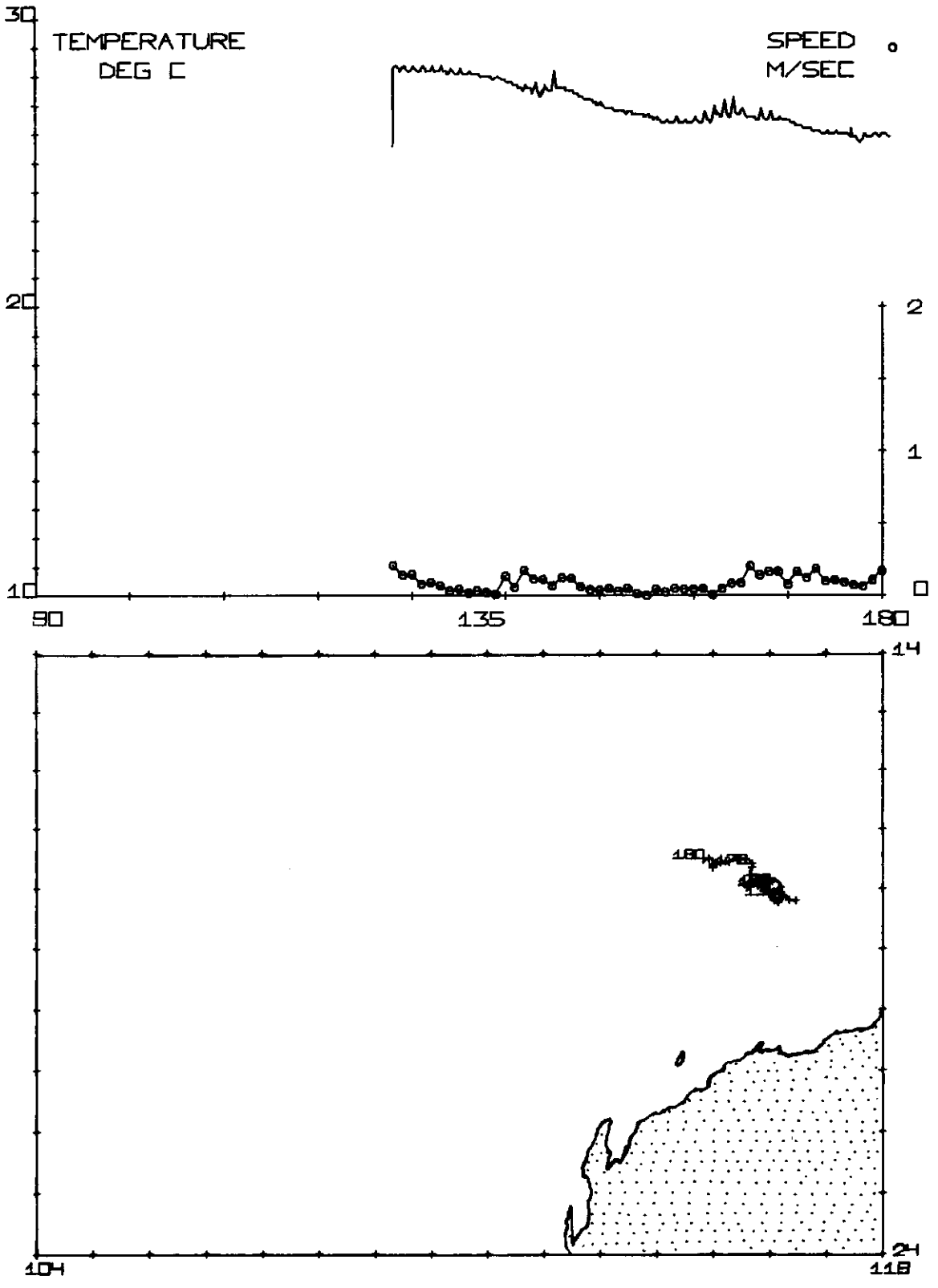
70
60
50
40
30
20
10
80

BUOY 1838 DAYS 90-180 82

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M/SEC
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90
135
180
14
24
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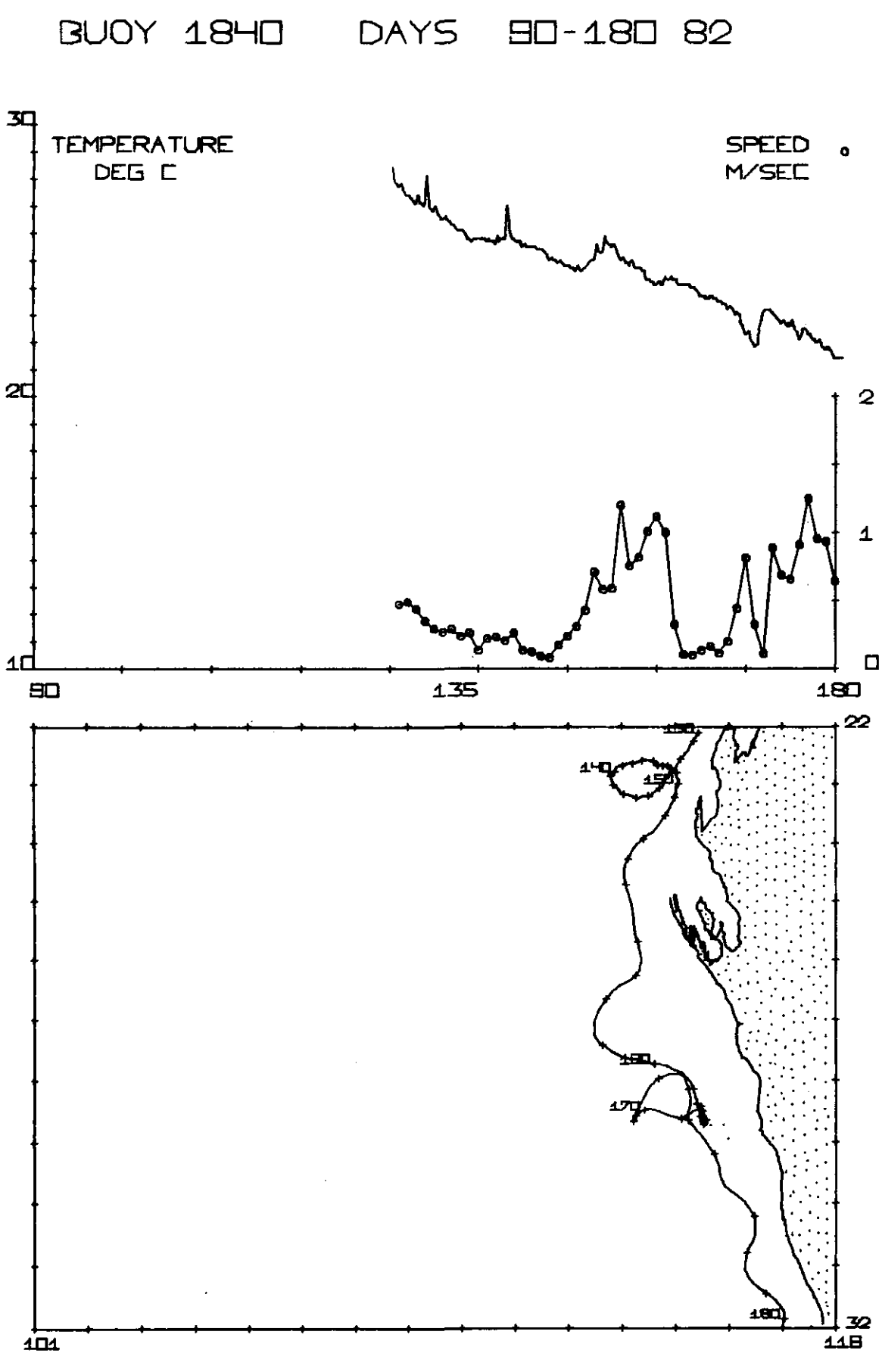
118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DEG C
SPEED
M/SEC
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20
10
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0
90
135
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22
32
101
118
140
150
160
170
180

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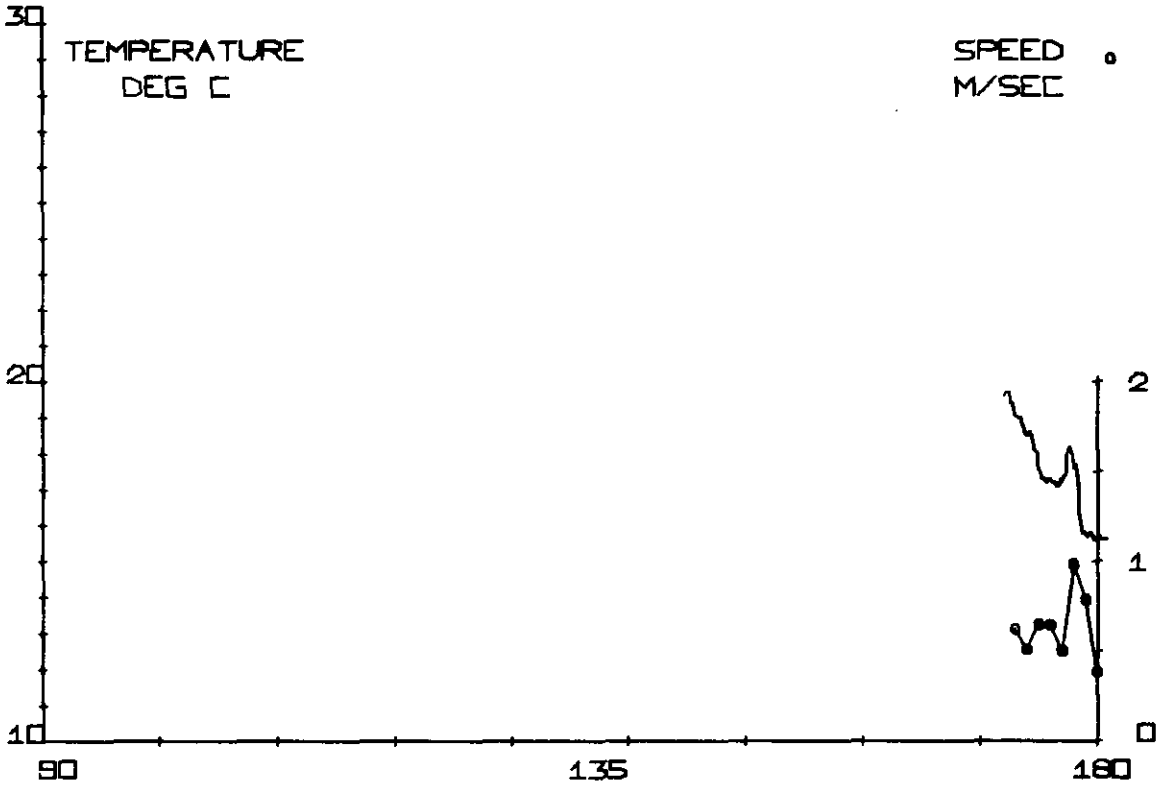

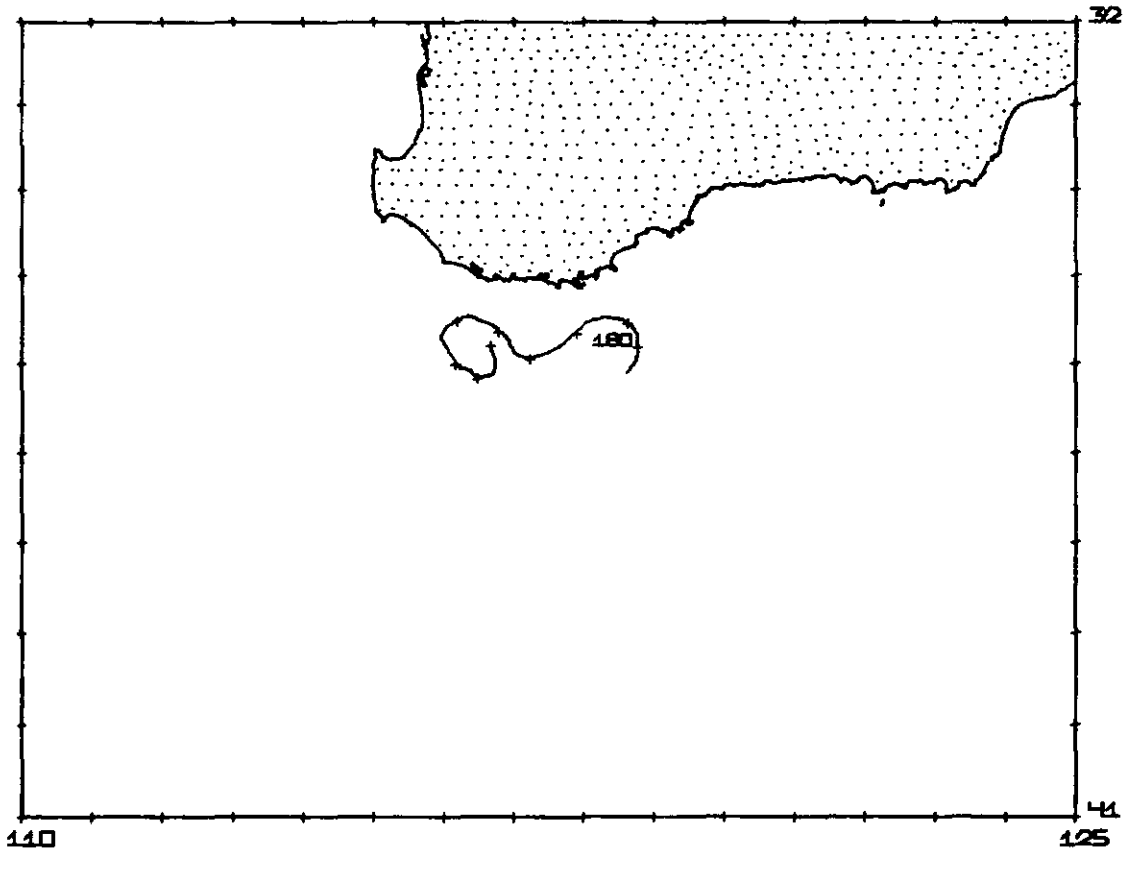

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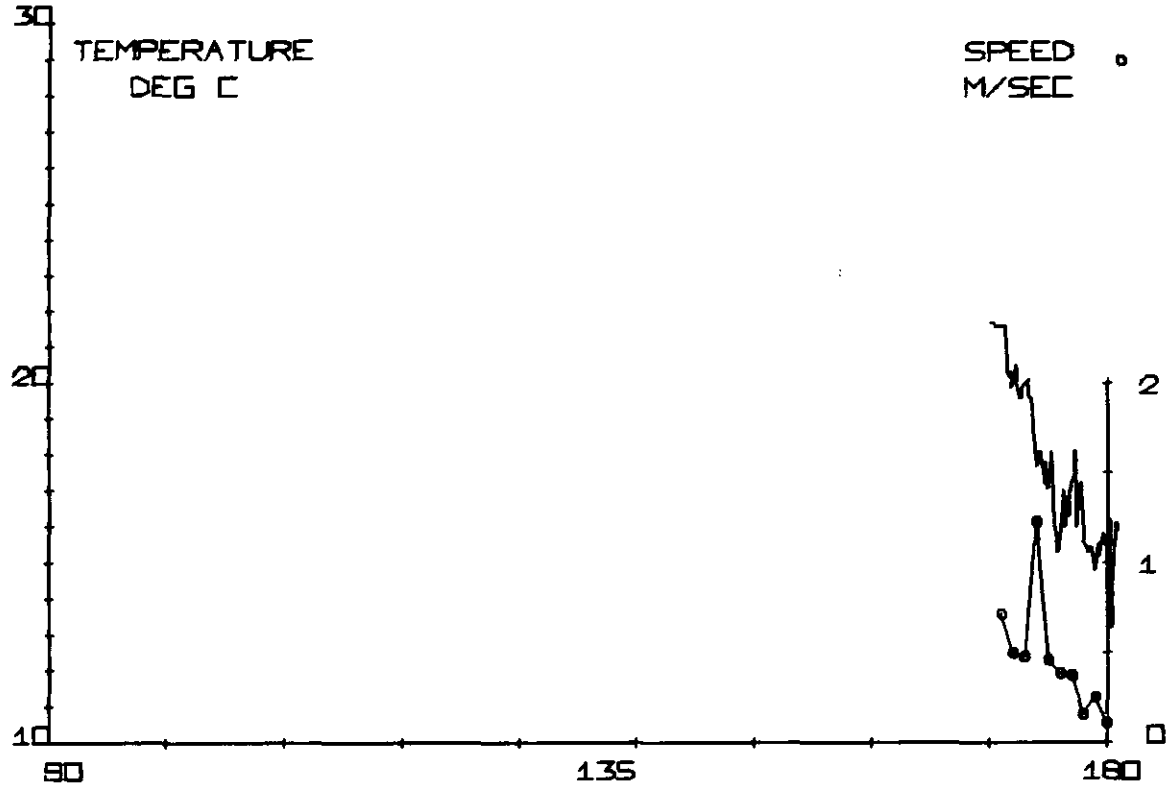

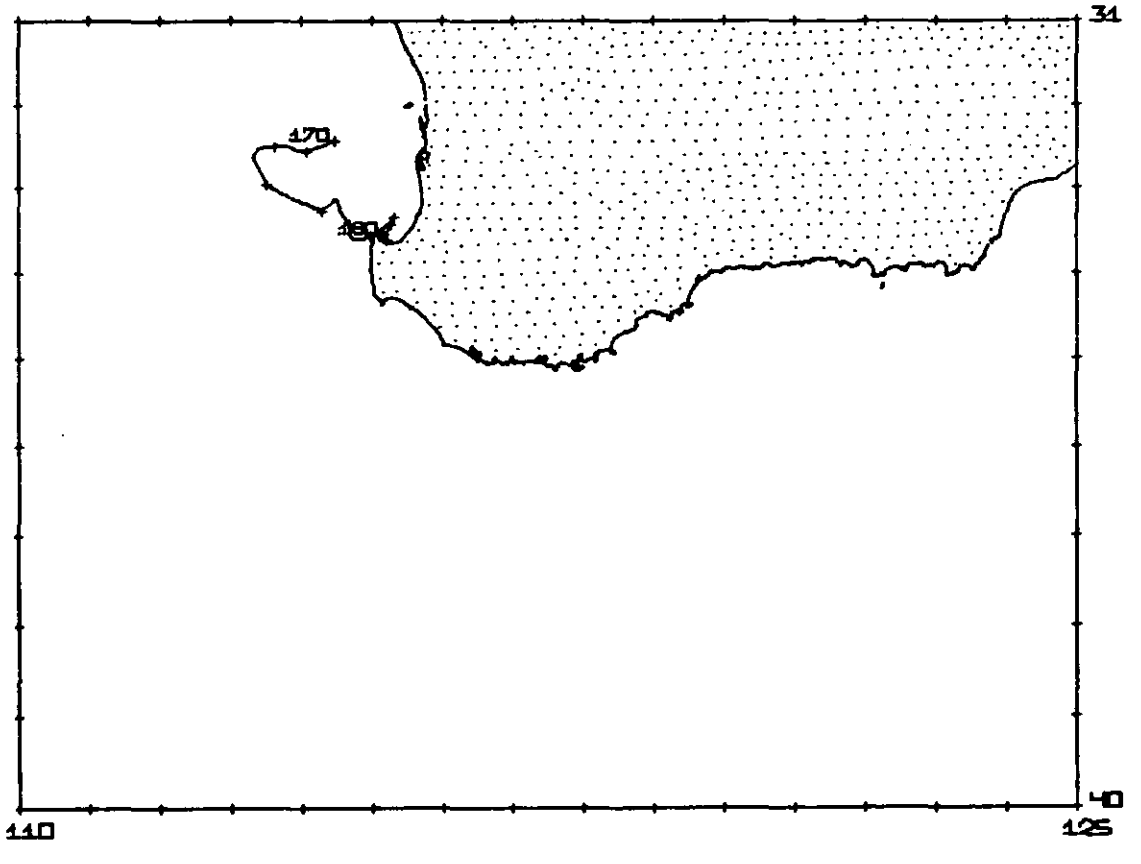

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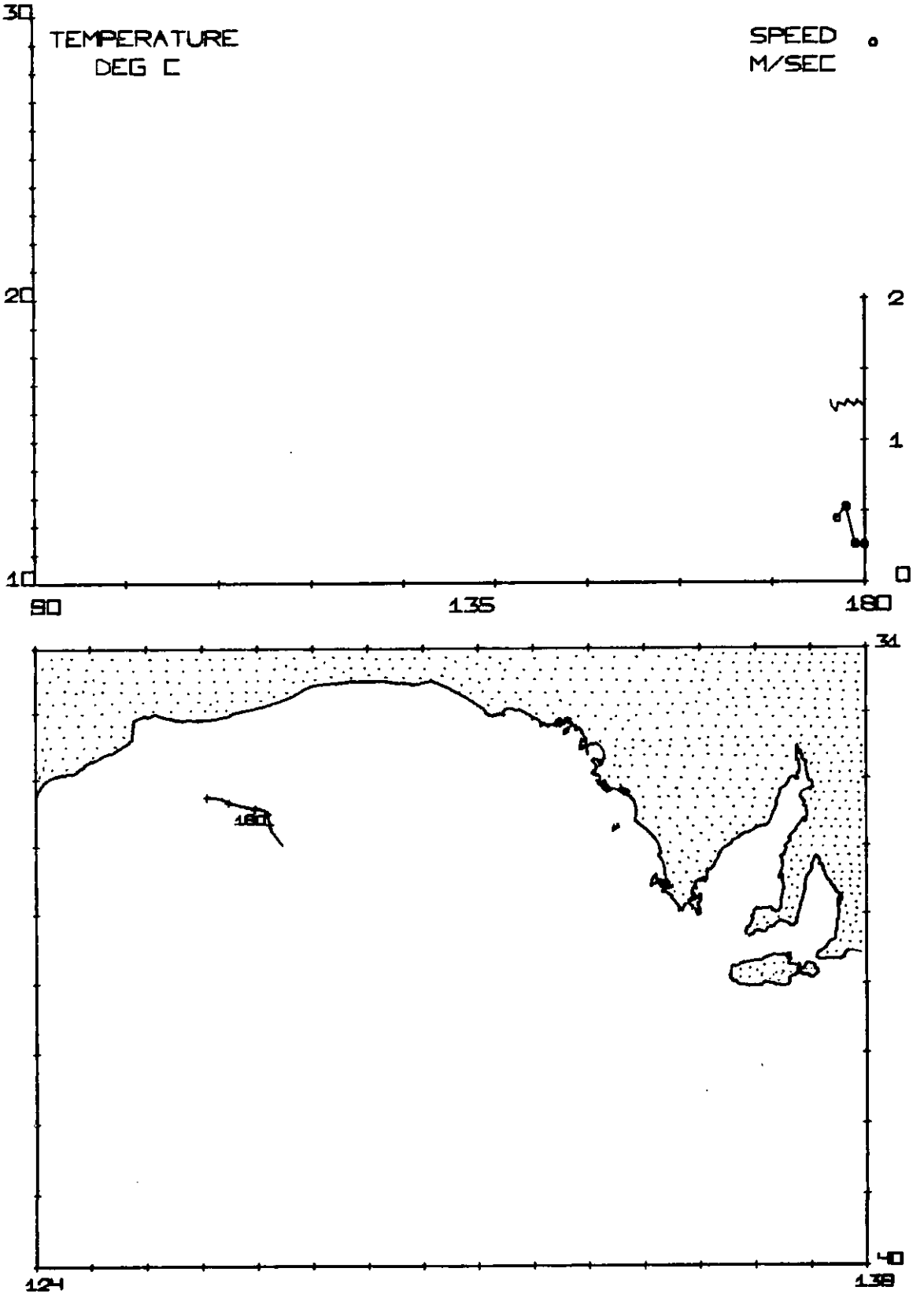

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